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Web-based System for Assisting Education: An Empirical Assessment

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Abstract

This research reports on the use of Web-based education and testing system at a Big Urban College (BUC). Students like the system but are not able to use it effectively because of certain design limitations. It identifies the factors that could improve the effectiveness of the system.

Web-based teaching tools can actually improve the teaching process. Most software systems available for online teaching usually help manage courseware, i.e. they allow instructors to place their course materials in an easy and efficient manner. Some allow for discussion-groups to debate issues, but they do not allow for on-line testing. This research reports on the use of Web-based one-line education and testing system at a Big Urban College (BUC). Students like the system but are not able to use it effectively because of certain design limitations.

Motivation

Distance Learning is rooted in the idea that communications technology can bring people together and actually improve the teaching process (Harasim, et al. 1995; Lewis 1997). Interest in distance learning system is driven in part by the desire to lower the cost of training. For several large commercial and governmental organizations, distance learning has translated into lower costs and greater participation (Greengard 1997). An asynchronous, cost-effective system of distance learning also reduces learning load and supports just-in-time learning. The modalities under consideration include general CD-ROM based multi-media training, exhaustive on-line databases of specific training material, computer-based video presentations, and web-based delivery systems.

Most universities are facing the same challenge as other organizations: how to improve the system of education and yet lower the costs (Harasim, et al. 1995). Universities have launched distance learning initiatives to improve accessibility to education, achieve higher economies of scale, and offer self-paced education. BUC introduced some new communication tools for students and professors, namely Electronic Campus (EC). The purpose of introducing the system is help the students and professors to improve the communication process, and to later spread the range of teaching and learning. The main part of EC used by students and professors is the Hypertest system. It has two components: One part allows students to submit their homework and for professors to check their homework on that website itself. The professors also advocate students to use it as a medium for group discussions and group meetings, especially for students who do not have much time for meeting their group members. The second part allows students to take online tests without coming to school. The students get immediate feedback on their performance and the professors also get a detailed analysis of student performance on each test. But meanwhile, the students do not use the system as frequently as expected, even though they like the system.

Usually, the emerging communication tools should attract people, especially the young college students, who always like trying new systems and want to follow the tide of their century. The situation here is obviously different. After talking to students, the researchers make two primary assumptions. One is that Hypertest system probably has its own shortcomings and limitations. Another is that there are a lot of alternative communications media for students to choose from. This research will study this problem and verify these assumptions.

Hypertest System

The Hypertest system was designed and created by system analysts at BUC. It is similar to the e-mail system. The professors and the students use the same web site address. Professors group their students and give each group a username and password to log into the system. It is like a white sheet of paper where students can write their homework and professors can evaluate these homeworks. However, Hypertest does not allow users to attach files, or to format the text. If students want to submit their prepared text from a diskette, then they must open it first in a word processing document and then cut-paste it into the Hypertest system without any formatting. Because the system is not convenient in terms of word processing, students prefer to use e-mail, telephone and fax instead of Hypertest for group meetings and discussions.

Additionally, from the user manual, the Hypertest system was designed to work best with Netscape version 3.0 or better. No problems have been reported with Internet Explorer version 3.0 or later. America Online's version 3.0 browser software also

works well with all student activities, but it will not provide the professors with access to commentary screen they can use under Netscape or IE. AOL's software also draws the screen somewhat differently, though this has not proven troublesome in practice. But if users try to log into the system using a lower version of the software than specified, they will encounter problems. This problem means that even though one can log into the Internet to send e-mail to friends, one can't communicate using Hypertest. If students can not log into the system, they would rather forget Hypertest. Some students said that it was difficult to log into the system. This problem will likely be solved in the future. Each student at BUC is given an e-mail account to communicate with each other. Besides the school e-mail account, many students have their own computers at home and connect to the internet from there. The other communication tools available are the telephone and the fax.

Research Hypotheses

Hypertest system was designed to provide students and professors with an efficient communication and teaching tool. It was hoped that Hypertest will enable the students and professors to write or post messages freely. But it does not satisfy the students completely. The usage of it is far less than e-mail.

There are two basic hypotheses in this exploratory research. The first hypothesis is that students do not use the system for some design problems, but that the system will fit students' submissions after making improvements.. The second hypothesis is that the Hypertest system is not integrated in the course designs very well and thus there is less of a reason to use it.

Data Collection Methods

This research adopted the survey method. There were three kinds of questions: the usage data for many modes of communication; the liking level for those communication media, and their open-ended comments about ways to improve the system and increase its usage. The survey instrument is shown in the Appendix. In addition, the researchers can access all actual-use data for the concerned students. The system also allows the users to leave their advice and suggestions for improvement. Their advice and suggestions provide the researchers with additional first-hand data. This research is based upon a survey research of the attitudes of 80 graduate and undergraduate business students who used the Hypertest system as a part of their course requirements.

Results

Interestingly, the primarily result shows that the attitudes to Hypertest and e-mail are similar to each other. For e-mail, 5.4% subject dislike it and 83.0% like it. For Hypertest these two numbers are 8.1% and 79.1% respectively. Even without statistical t-testing, it is clear that they like it as they like e-mail. However, the frequency of usage of the two tools is far different. For e-mail, 84% students use it at least once a day, or more often. For Hypertest system, however, more than 50% of the students use it only once a month. Why is it that students like Hypertest as they like e-mail, but only prefer to use e-mail for their communication needs? We can find some answers from the subjective opinions given by students in the survey. The main problems mentioned by the students are as following:

The answers fall in three categories:

- Students like the system but do not use it because it is difficult to access the system from home. Web Server capacity may of concern here. In addition, those using AOL as their browser and ISP face some compatibility problems.
- Some students like the system but do not use it because they find it inconvenient to use. For the Hypertest Essay system, the lack of advanced editing functions such as fonts, and MIME attachments, etc. makes the system difficutl to use. For the online test, students find that is not effective because it is easy to cheat. Also, it is mainly good for multiple choice tests.
- Some students find that the tools are not integrally linked to the course outline.

These suggestions may look trivial, but the designers and instructors should not ignore them. Addressing these issues can make a difference between merely liking the system and actually using it. The purpose of the Hypertest is fine, but because of limitations on design and the manner of use, it is facing challenges.

After talking with students, the researchers found that though Hypertest system is not good enough to satisfy all of student needs. However, it could be a tool to help students hand in their homework. For that to happen, the tool should add some editing functions to help students format their work, and attach files. If the system does not change, it will be difficult for students to accept it. The server capacity can also be increased to improve access speed.

Contribution

This research adds to the growing body of research in testing software for on-line teaching. In testing web-based software technologies to specifically address structured communication needs and self-assessment through on-line testing, this study found that students liked the new tools but still continue to use the general-purpose e-mail system for most of their requirements.

Future Research

Upon making the requisite improvements into the system, controlled studies could be devised to understand the motivations for and results of the use of web-based communication and assessment techniques. In the future, the researchers can make a detailed study among a large range of students with the help of other professors. Researchers can divide students into different groups. One group is allowed to use the Hypertest system for communication with each other. The second group can use email or other kinds of tools. By collecting and analyzing data from several hundred respondents, the researchers can get some results on making more effective the use of these tools.

References

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Appendix

Research Survey On Hypertest System At Big Urban College

Date: _____

1. Your age is o 18-22 o 22-25 o 25-30 o over 30=

2. You are o male o female

3. Your program is o BBA o MBA o MPA o M.S o Ph.D

4. Your major is

5. What kinds of communication tools do you use:
   o E-mail o telephone o Fax o Hypertest system o Electronic Essay

6. When did you use the first time: Hypertest: _____ Electronic Essay: _____

7. How frequently you use the tools and how do you like them?

Tool	**Usage (select one for each tool)**				**Liking (select one for each tool)**				
	More than once a day	Once a day	Once a week	Once a month	Strongly like	Like	Neutral	Dis-like	Strongly dislike
E-mail									
Telephone									
Fax									
Hyper-test									
Hypertest Essay									

8. Please write your opinions about Hypertest System.
   a. What are its disadvantages and advantages? What is its likely beneficial usage?
   b. What changes would you like to be made to improve Hypertest and make it more useful?
   c. Would you like Hypertest to be used in other courses? And if yes, in what way?